

Interfacing Radio and Crypto Devices to ViaSat Data Controllers

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1. Introduction

This document describes the recommended method for interfacing a variety of different radio and crypto devices to ViaSat Data Controllers (VDC-200, VDC-300, VDC-400, VDC-500, and VDC-600). The following list of radio and crypto's are some of the most common devices to be used with ViaSat Data Controllers.

- KY-57
- AN/CSZ-1A
- KY-99/A
- SINCGARS
- KY-58
- LST-5E
- KG-84A/C
- STU-III
- ANDVT
- AN/PSC-5
- KY-100
- AN/PRC-117F/150/138B
- KIV-7
- PRC-138
- PRC-6725E
- PRC-139
- Saber Radio
- ARC-210 (RT-1794)

ViaSat produces and sells cables to interconnect data controllers with many of these devices. Section 3 lists the ViaSat cables for each data controller along with their model number. For users interested in building a custom cable interface, Section 4 describes the radio/crypto interface for each data controller. Section 5 details the pin connection between ViaSat Data Controllers and each of the above listed radio/crypto devices.

The standard RS-232 interface used on the VDC is designed to connect easily to most any type of radio and crypto device, with support for a variety of different data rates and clocking schemes. For assistance on interfacing to devices that are not described here, check for the latest version of this document at www.viasat.com, e-mail us at vdc@viasat.com, check our on-line users forum at www.vdcforum.com or phone us at 760-476-4754 or 1-888-VIASAT-4. For specific information regarding the electrical interface and general operation of ViaSat Data Controllers, refer to the appropriate operator's manual.

2. Reference Documentation

The following documents are available in pdf format on the ViaSat website at
www.viasat.com.

Description	Source	Document ID
CDC VDC-200 Operator's Manual	ViaSat	VSD-610400-94-086
ADC VDC-300 Operator's Manual	ViaSat	VSD-700150-95-139
PDC VDC-400 User's Guide	ViaSat	VSD-613800-97-071
ADC/IP VDC-500 Operator's Manual	ViaSat	VSD-618000-96-139
PDC II VDC-600 User's Guide	ViaSat	1005359

3. ViaSat Cables

The following tables list the cables available from ViaSat for interfacing ViaSat Data Controllers to multiple radio/crypto devices. For more information on any of these cables, and an up-to-date listing of the latest cables, visit our website at www.viasat.com or contact our VDC sales staff at 760-476-4754 or 1-888-VIASAT-4.

Table 3-1 ViaSat Cables for VDC-200, 300, and 500

Cable Description	ViaSat Part No.
Cable to Computer RS-232	CBL-003811 CBL-017642
Cable to KY-57, AN/CSZ-1A, KY-99, PRC-117F (J1), or SINCGARS	CBL-003810
Cable to KG-84A	CBL-003812
Cable to KG-84C	CBL-003813
Cable to STU-III and STE	CBL-004387
Cable to KY-99A	VA-009066
Adapter to use CBL-3810 with KY-99A	VA-009067
Cable to KY-58	CBL-007555
Cable to AN/PSC-5	CBL-009110
Cable to LST-5D/E	CBL-009111
Cable to KIV-7	CBL-009123
Cable to AN/PRC-117F,-138B,-150	CBL-017641
Cable to KY-100 Narrowband [†]	CBL-009125
Cable to ViaSat VCS-232 Channel Simulator [†]	CBL-009108
Cable to PRC-6725E (PRC-139), MBITR (PRC-148) available from Racal (1-800-258-4420)	

[†] Only available for VDC-300, 500

Table 3-2 ViaSat Cables for VDC-400, 600

Cable Description	ViaSat Part No.
Cable to KY-57, AN/CSZ-1A, KY-99, PRC-117F (J1), or SINCGARS	CBL-006582
Cable to KG-84A	CBL-009128
Cable to KG-84C	CBL-009127
Cable to STU-III and STE	CBL-006586
Cable to KY-99A	CBL-009076
Cable to KY-58, KY-100 Wideband	CBL-006583
Cable to AN/PSC-5	CBL-009075
Cable to LST-5D/E	CBL-009112
Cable to KIV-7	CBL-009124
Cable to AN/PRC-117F,-138B,-150	CBL-017640
Cable to KY-100 Narrowband	CBL-009126
Cable to ViaSat VCS-232 Channel Simulator	CBL-009107
Unterminated Cable for RS-232 voltage levels	CBL-009077
Unterminated Cable for MIL-STD-188-114A voltage levels	CBL-009090
Cable to PRC-6725E (PRC-139), MBITR (PRC-148) available from Racal (1-800-258-4420)	

4. Data Controller Interface Description

This section briefly describes the radio/crypto interface for each data controller.

4.1 Compact Data Controller (CDC) VDC-200

The VDC-200 interfaces to external radio/crypto devices through the 15-pin d-subminiature male connector located on the rear of the unit, labeled “CRYPTO PORT”. When building a cable to interface to the VDC-200, we recommend using an EMI backshell with shielded cabling (double braid). The following table lists recommended (not required) hardware for building a cable to a VDC-200.

Table 4-1 VDC-200 Cable Hardware

Manufacturer	Part Number	Description
AMP	205557-2	15-pin d-sub female connector
AMP	748676-2	15-pin d-sub backshell, EMI/RFI
AMP	747784-3	2 Jackscrews, 4-40
Belden	9945	Cable, Shielded, 22AWG, 9 Conductors

The following table describes the radio/crypto interface on the VDC-200.

Table 4-2 VDC-200 Radio/Crypto Interface

Crypto Pin	Signal	Description	Direction
1	Not used		
2	RXD / HA	Receive data / Handset Analog	Input
3	TXD	Transmit Data	Output
4	DTR	Data Terminal Ready	Output
5	GND	Signal Ground	
6	TXC	Transmit clock	Input
7	RTS	Request To Send	Output
8	CTS	Clear To Send	Input
9	RXC / HD	Receive Clock / Handset Dynamic Mic	Input
10	PTT	Push-To-Talk	Output
11	DM	Digital mode select	Output
12	CT0	Device Type Bit 0	Input
13	CT1	Device Type Bit 1	Input
14	CT2	Device Type Bit 2	Input
15	Not used		

The VDC-200 uses the crypto type (CT) pins to determine what type of device it is interfaced to. Each one of these pins is left unconnected or is connected directly to ground depending upon the radio/crypto device. Section 5 shows the recommended

connection of these pins for each radio/crypto device. Refer to the VDC-200 Operator's Manual for further details.

4.2 Airborne Data Controller (ADC) VDC-300

The VDC-300 interfaces to external radio/crypto devices through the 15-pin d-subminiature male connector located on the rear of the unit, labeled "J1". When building a cable to interface to the VDC-300, we recommend using an EMI backshell with shielded cabling (double braid). The following table lists recommended (not required) hardware for building a cable to a VDC-300.

Table 4-3 VDC-300 Cable Hardware

Manufacturer	Part Number	Description
AMP	205557-2	15-pin d-sub female connector
AMP	748676-2	15-pin d-sub backshell, EMI/RFI
AMP	747784-3	2 Jackscrews, 4-40
Belden	9945	Cable, Shielded, 22AWG, 9 Conductors

The following table describes the radio/crypto interface on the VDC-300.

Table 4-4 VDC-300 Radio/Crypto Interface

Crypto Pin	Signal	Description	Direction
1	HPDMIC	Handset Dynamic Mic	Output
2	RXD / HA	Receive data / Handset Analog	Input
3	TXD	Transmit Data	Output
4	DTR	Data Terminal Ready	Output
5	GND	Signal Ground	
6	TXC	Transmit clock	Input
7	RTS	Request To Send	Output
8	CTS	Clear To Send	Input
9	RXC / HD	Receive Clock / Handset Dynamic Mic	Input
10	PTT	Push-To-Talk	Output
11	DM	Digital mode select	Output
12	NC	Not connected	
13	NC	Not connected	
14	NC	Not connected	
15	HPAO	Handset Analog	Input

The crypto select switch on the front panel of the VDC-300 is used to select the type of radio/crypto device the VDC-300 is interfaced to.

4.3 Personal Data Controller (PDC) VDC-400

The VDC-400 interfaces to external radio/crypto devices through the 25-pin male connector on the rear of the card. The 25-pin interface on the VDC-400 is custom and requires the use of a custom connector and shell to interface to it. User's can purchase from ViaSat the custom connector and shell molded onto an unterminated cable. This cable will allow users to build their own interface to the VDC-400. The cable comes in two varieties; one enables RS-232 signaling on the VDC-400; and the other enables MIL-STD-188-114 signaling.

Table 4-5 VDC-400 Cable Hardware

Manufacturer	Part Number	Description
ViaSat	CBL-009077-0000	Cable, Unterminated RS-232 to VDC-400/600
ViaSat	CBL-009090-0000	Cable, Unterminated 114 to VDC-400/600

The following table describes the radio/crypto interface on the VDC-400.

Table 4-6 VDC-400 Radio/Crypto Interface

Crypto Pin	Signal	Description	Direction
1	PTT	Push To Talk	Output
2	RXC	Receive clock	Input
3	DM	Data mode select	Output
4	RXD	Receive Data	Input
5	DCD	Data Carrier Detect	Input
6	DTR	Data Terminal Ready	Output
7	TXCLKI	Transmit Clock	Input
8	RTS	Request to Send	Output
9	TXCLK_O	Transmit Clock	Output
10	CTS	Clear to Send	Input
11	TXD	Transmit Data	Output
12	GND	Signal Ground	
13-19	RESERVED	Leave unconnected	
20	RS232_SEL0	RS232 Select pin 0. Connect this to pin 21 for RS-232 output signal level, leave unconnected for MIL-STD-188-114A output signal level.	
21	RS232_SEL1	RS232 Select pin 1. See above.	
22-25	RESERVED	Leave unconnected	

The following table lists the color codes that correspond to the supported signals on CBL-009077 and CBL-009090.

Table 4-7 VDC-400/600 Unbalanced Cable Wire Colors

Crypto Pin	Signal	ViaSat Cable Wire Color
1	PTT	Black
2	RXC	Black/White
3	DM	Brown
4	RXD	Brown/White
5	DCD	Red
6	DTR	Red/White
7	TXCLKI	Orange
8	RTS	Orange/White
9	TXCLK_O	Yellow
10	CTS	Yellow/White
11	TXD	Green/White
12	GND	Green

When interfacing the VDC-400 to external devices, the radio/crypto type must be selected through the software interface. Refer to the VDC-400 User's Guide for further information on selecting the appropriate radio/crypto type.

4.4 IP Data Controller (ADC/IP) VDC-500

The VDC-500 interfaces to external radio/crypto devices through the 15-pin d-subminiature male connector located on the rear of the unit, labeled "J2". When building a cable to interface to the VDC-500, we recommend using an EMI backshell with shielded cabling (double braid). The following table lists recommended (not required) hardware for building a cable to a VDC-500.

Table 4-8 VDC-500 Cable Hardware

Manufacturer	Part Number	Description
AMP	205557-2	15-pin d-sub female connector
AMP	748676-2	15-pin d-sub backshell, EMI/RFI
AMP	747784-3	2 Jackscrews, 4-40
Belden	9945	Cable, Shielded, 22AWG, 9 Conductors

The following table describes the radio/crypto interface on the VDC-500.

Table 4-9 VDC-500 Radio/Crypto Interface

Crypto Pin	Signal	Description	Direction
1	HPDMIC	Handset Dynamic Mic	Output
2	RXD / HA	Receive data / Handset Analog	Input
3	TXD	Transmit Data	Output
4	DTR	Data Terminal Ready	Output
5	GND	Signal Ground	
6	TXC	Transmit clock	Input
7	RTS	Request To Send	Output
8	CTS	Clear To Send	Input
9	RXC / HD	Receive Clock / Handset Dynamic Mic	Input
10	PTT	Push-To-Talk	Output
11	DM	Digital mode select	Output
12	CT0	Device Type Bit 0	Input
13	CT1	Device Type Bit 1	Input
14	CT2	Device Type Bit 2	Input
15	HPAO	Handset Analog	Input

The VDC-500 uses either the front panel crypto switch or the crypto type (CT) pins to determine the type of device it is interfaced to. It is important to leave the crypto type pins unconnected when using the front panel switch. When using the crypto type pins, the front panel switch should be turned to position 7. When used, each of the crypto type pins are left unconnected or are connected directly to ground depending upon the radio/crypto device. This pinouts shown in section 5 of this document for the VDC-500 assume the front panel crypto switch will be used for selecting the crypto device. When using the crypto type pins, follow the pinouts given for the VDC-200 for the CT0, CT1, and CT2 pin.

4.5 Personal Data Controller (PDC II) VDC-600

The VDC-600 uses the exact same physical connector as used in the VDC-400 (see Section 4.3). In addition, signals 1-12 are the same between the VDC-400 and VDC-600, therefore all VDC-400 cables are fully compatible with the VDC-600. Unlike the VDC-400, the VDC-600 does not require the use of a custom cable or special wiring to switch between unbalanced RS-232 and MIL-STD-188-114 signaling; the VDC-600 always produces a constant voltage level that is compliant with both standards. Therefore, when building cables to interface to the VDC-600 unbalanced, both ViaSat cables CBL-009077-0000 and CBL-009090-0000 will work equally well (see Section 4.3).

Table 4-10 VDC-600 Cable Hardware

Manufacturer	Part Number	Description
ViaSat	CBL-009077-0000	Cable, Unterminated RS-232 to VDC-400/600
ViaSat	CBL-009090-0000	Cable, Unterminated 114 to VDC-400/600
ViaSat	Contact ViaSat	Cable, Unterminated Balanced 114/RS-422 to VDC-600

The following table describes the radio/crypto interface on the VDC-600.

Table 4-11 VDC-600 Radio/Crypto Interface

Crypto Pin	Signal	Description	Direction
1	PTT	Push To Talk	Output
2	RXCN	Receive clock negative	Input
3	DM	Data mode select	Output
4	RXDN	Receive Data negative	Input
5	DCD	Data Carrier Detect	Input
6	DTR	Data Terminal Ready	Output
7	TXCIN	Transmit Clock negative	Input
8	RTS	Request to Send	Output
9	TXCLK_O	Transmit Clock	Output
10	CTS	Clear to Send	Input
11	TXDN	Transmit Data negative	Output
12	GND	Signal Ground	
13	RESERVED	Leave unconnected	
14	TXCIP	Transmit Clock positive	Input
15	RXDP	Receive Data positive	Input
16	RXCP	Receive Clock positive	Input
17	TXDP	Transmit Data positive	Output
18-19	Reserved	Do not connect	
20	GND	Signal Ground	
21	RESERVED	Do not connect	
22	BALSEL	Balance Select, ground for balanced signaling	Input
23-25	RESERVED	Do not connect	

When interfacing the VDC-600 to external devices, the radio/crypto type must be selected through the software interface. Refer to the VDC-600 User's Guide for further information on selecting the appropriate radio/crypto type.

5. Device Interface Description

The following section details the recommended pin connection between all ViaSat data controllers and each respective radio/crypto device.

Note: ViaSat assumes no liability for the data contained in the following sections. We strongly recommend consulting the user's manual for each radio/crypto device to verify the respective interface is consistent with what is listed here and is compatible with the VDC interface.

5.1 KY-57, AN/CSZ-1A, KY-99, PRC-117F (J1), SINCGARS

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KY-57,AN/CSZ-1A,KY-99, PRC-117F (J1), SINCGARS	Audio/Data	General Connector GC-329	Position 7, KY-57

**Table 5-1 Connecting VDC to KY-57, AN/CSZ-1A, KY-99, PRC-117F (J1)
SINCGARS**

VDC-200	VDC-300/500	VDC-400/600	KY-57	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	B	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	F	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	A	GND	Signal Ground
-	-	7	D	TXC	Transmit clock to VDC
-	-	8,10 [‡]	-	RTS	Request To Send from VDC
-	-	10,8 [‡]	-	CTS	Clear To Send to VDC
9	9	2	D	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	10	1	C	PTT	Push-To-Talk from VDC
11	11	3	E	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
-	-	N/A	-	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

[‡] Tie signals together only on this interface

5.2 KY-99A

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KY-99A	Fill/Data	General Connector GC-329	Position 7, KY-57

Table 5-2 Connecting VDC to KY-99A

VDC-200	VDC-300/500	VDC-400/600	KY-99A	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	B	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	F	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	A	GND	Signal Ground
-	-	7	D	TXC	Transmit clock to VDC
7	7	8	C [‡]	RTS	Request To Send from VDC
-	-	10	-	CTS	Clear To Send to VDC
9	9	2	D	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	1	-	PTT	Push-To-Talk from VDC
11	11	3	E	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
-	-	N/A	-	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

[‡] This signal is PTT on the KY-99A

5.3 KY-58 Half Duplex

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KY-58 Half Duplex	Audio/Data, J2	QPL MS3116F1419S	Position 6, KY-58 HD

Table 5-3 Connecting VDC-300, 500 to KY-58 Half Duplex

VDC-300/500	KY-58	Signal Name	Description
1	M	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	C	RXD / HA	Receive data / Handset Analog to VDC
3	D	TXD	Transmit Data from VDC
-	-	DTR	Data Terminal Ready from VDC
5	F	GND	Signal Ground
5	B,N	GND	Analog Ground
-	V	TXC	Transmit clock to VDC
-	-	RTS	Request To Send from VDC
-	-	CTS	Clear To Send to VDC
9	V	RXC / HD	Receive Clock / Handset Dynamic Mic to VDC
10	P	PTT	Push-To-Talk from VDC
11	R	DM	Digital mode select from VDC
-	F	CT0	Device Type Bit 0
-	-	CT1	Device Type Bit 1
-	-	CT2	Device Type Bit 2
15	K	HPAO	Dedicated Handset Analog to VDC
N/A	-	DCD	Data Carrier Detect to VDC

‡ Tie signals together only on this interface

Because the VDC-200, 400, and 600 do not have dedicated analog pins on the radio/crypto interface, ViaSat suggests connecting a handset directly to the KY-58 audio/data connector along with the VDC-200, 400, or 600 using a “Y-type” cable when voice mode is required. The following figure depicts the proposed configuration.

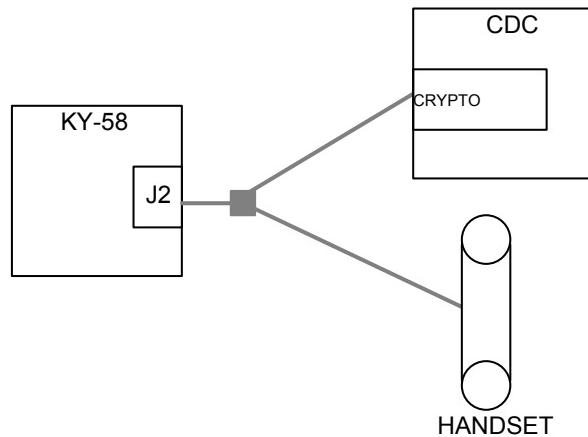


Figure 5-1 KY-58 “Y” Cable for Voice Mode

Table 5-4 depicts the correct connection between the VDC-200, 400 and KY-58 with the optional handset.

Table 5-4 Connecting VDC-200, 400, 600 to KY-58 Half Duplex

VDC-200	VDC-400/600	KY-58	Handset (optional)	Signal Name	Description
N/A	N/A	M	D	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	4	C	-	RXD / HA	Receive data / Handset Analog [†] to VDC
3	11	D	-	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	12	F	-	GND	Signal Ground
-	-	B,N	A	GND	Analog Ground
-	7	V	-	TXC	Transmit clock to VDC
-	8,10 [‡]	-	-	RTS	Request To Send from VDC
-	10,8 [‡]	-	-	CTS	Clear To Send to VDC
9	2	V	-	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	1	P	C	PTT	Push-To-Talk from VDC
11	3	R	-	DM	Digital mode select from VDC
12	N/A	F	-	CT0	Device Type Bit 0
-	N/A	-	-	CT1	Device Type Bit 1
-	N/A	-	-	CT2	Device Type Bit 2
N/A	N/A	K	B	HPAO	Dedicated Handset Analog to VDC
N/A	-	-	N/A	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

[‡] Tie signals together only on this interface

5.4 KY-58 Full Duplex

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KY-58 Full Duplex	Audio/Data, J2	QPL MS3116F1419S	Position 3, KY-58 FD

Full duplex communications can be achieved by using two KY-58's and a full duplex radio. In this case a "Y-type" cable is needed to connect the VDC to two KY-58's as shown below.

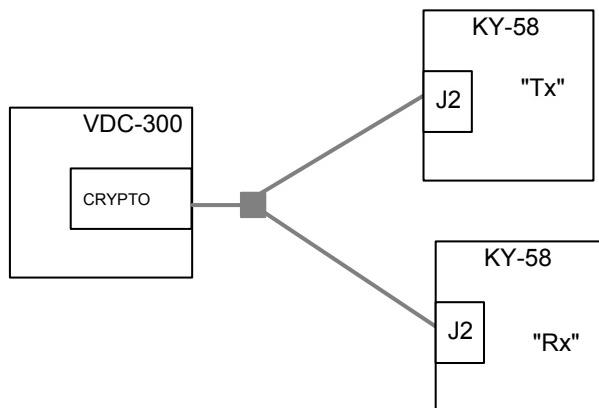


Figure 5-2 KY-58 "Y-type" Cable for Full Duplex Operation

Table 5-5 shows the connection between the VDC-300, 400, and 500 for KY-58 full duplex operation.

Table 5-5 Connecting VDC-300, 500 to KY-58 Full Duplex

VDC-300/500	“TX” KY-58	“RX” KY-58	Signal Name	Description
1	M	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	-	C	RXD / HA	Receive data / Handset Analog to VDC
3	D	-	TXD	Transmit Data from VDC
-	-	-	DTR	Data Terminal Ready from VDC
5	F	F	GND	Signal Ground
5	B,N	B,N	GND	Analog Ground
6	V	-	TXC	Transmit clock to VDC
-	-	-	RTS	Request To Send from VDC
-	-	-	CTS	Clear To Send to VDC
9	-	V	RXC / HD	Receive Clock / Handset Dynamic Mic to VDC
10	P	-	PTT	Push-To-Talk from VDC
11	R	R	DM	Digital mode select from VDC
-	-	-	CT0	Device Type Bit 0
-	-	-	CT1	Device Type Bit 1
-	-	-	CT2	Device Type Bit 2
15	-	K	HPAO	Dedicated Handset Analog to VDC
N/A	-	-	DCD	Data Carrier Detect to VDC

Because the VDC-200, 400, and 600 do not have dedicated analog pins on the radio/crypto interface as described in section 5.3, it will be necessary to add an additional cable into the Y configuration described above in order to achieve voice mode with the VDC-200 in full duplex operation. The following table describes the interface.

Table 5-6 Connecting VDC-200, 400 to KY-58 FD

VDC-200	VDC-400/600	“TX” KY-58	“RX” KY-58	Handset (optional)	Signal Name	Description
N/A	N/A	M	-	D	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	4	-	C		RXD / HA	Receive data / Handset Analog [†] to VDC
3	11	D	-	-	TXD	Transmit Data from VDC
-	-	-	-	-	DTR	Data Terminal Ready from VDC
5	12	F	F		GND	Signal Ground
5	-	B,N	B,N	A	GND	Analog Ground
6	7	V	-	-	TXC	Transmit clock to VDC
-	8,10 [‡]	-	-	-	RTS	Request To Send from VDC
-	10,8 [‡]	-	-	-	CTS	Clear To Send to VDC
9	2	-	V		RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	1	P	-	C	PTT	Push-To-Talk from VDC
11	3	R	R		DM	Digital mode select from VDC
-	N/A	-	-	-	CT0	Device Type Bit 0
-	N/A	-	-	-	CT1	Device Type Bit 1
14	N/A	F	F	-	CT2	Device Type Bit 2
N/A	N/A	-	K	B	HPAO	Dedicated Handset Analog to VDC
N/A	-	-	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

[‡] Tie signals together only on this interface

5.5 LST-5D/E

The VDC can connect to the 6-pin audio connector on the LST-5D/E using the KY-57 cable described in section 5.1. This section describes the interface to the 13-pin data connector on the LST-5D/E.

Channel Device	Interface	Mating Connector	VDC Crypto Mode
LST-5E	Data	QPL MS27473T10B35P	Position 4, KG-84 HD / MD-1324

Table 5-7 Connecting VDC to LST-5D/E

VDC-200	VDC-300/500	VDC-400/600	LST-5	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	3	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	4	TXD	Transmit Data from VDC
4	4	6	5	DTR	Data Terminal Ready from VDC
5	5	12	6	GND	Signal Ground
6	6	7	11	TXC	Transmit clock to VDC
7	7	8	8	RTS	Request To Send from VDC
8	8	10	9	CTS	Clear To Send to VDC
9	9	2	12	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	6	CT0	Device Type Bit 0
13	-	N/A	6	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.6 KG-84A/C

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KG-84A/C	Red Data	QPL MS2746T17B35S	Position 4, KG-84 HD / MD-1324 Position 2, KG-84 FD

Table 5-8 Connecting VDC to KG-84A/C

VDC-200	VDC-300/500	VDC-400/600	KG-84A/C	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	7	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	18	TXD	Transmit Data from VDC
4	4	6	38	DTR	Data Terminal Ready from VDC
5	5	12	1,3,14,17	GND	Signal Ground
6	6	7	16	TXC	Transmit clock to VDC
7	7	8	11	RTS	Request To Send from VDC
8	8	10	19	CTS	Clear To Send to VDC
9	9	2	21	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	1	CT0	Device Type Bit 0
13 ¹	-	N/A	1	CT1	Device Type Bit 1
14 ²	-	N/A	1	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC
N/A	N/A	N/A	29,41 [‡]	UNBAL-P	Unbalanced Red Interface to +6V

[†] Signals used in voice mode only, not supported in VDC-400/600

[‡] Tie signals together only on this interface for KG-84C only

1 Connect only for half duplex operation

2 Connect only for full duplex operation

5.7 STU-III

Channel Device	Interface	Mating Connector	VDC Crypto Mode
STU-III	Data	Amphenol 117DB-25P Amphenol 117DB-37P	Position 1, STU III

The STU-III data interface can be either a 25-pin or 37-pin D-type interface. In the table below, the connections for the 37-pin interface is listed in parentheses.

Table 5-9 Connecting VDC to STU-III

VDC-200	VDC-300/500	VDC-400/600	STU-III	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	3(6)	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	2(4)	TXD	Transmit Data from VDC
4	4	6	20(12)	DTR	Data Terminal Ready from VDC
5	5	12	1,7(1,19, 20,37)	GND	Signal Ground
6	6	7	15(5)	TXC	Transmit clock to VDC
7	7	8	4(7)	RTS	Request To Send from VDC
8	8	10	5(9)	CTS	Clear To Send to VDC
9	9	2	17(8)	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
13	-	N/A	1	CT1	Device Type Bit 1
14	-	N/A	1	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.8 ANDVT Tacterm Interface Unit J-3953

The VDC-300, 400, and 500 can connect to the 6-pin audio connector on the ANDVT using the KY-57 cable described in section 5.1. The VDC-200 strapping differs in order to place the unit in ANDVT mode.

Channel Device	Interface	Mating Connector	VDC Crypto Mode
ANDVT	Data 2J4	GC-329	Position 5, ANDVT

Table 5-10 Connecting VDC to ANDVT Interface Unit J-3953

VDC-200	VDC-300/500	VDC-400/600	ANDVT	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	B	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	F	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	A	GND	Signal Ground
-	-	-	-	TXC	Transmit clock to VDC
-	-	8,10 [*]	-	RTS	Request To Send from VDC
-	-	10,8 [‡]	-	CTS	Clear To Send to VDC
9	9	2	D	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	10	1	C	PTT	Push-To-Talk from VDC
11	11	3	E	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
14	-	N/A	A	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

^{*} Tie signals together only on this interface

5.9 ANDVT Tacterm Red Digital I/O (J2)

Channel Device	Interface	Mating Connector	VDC Crypto Mode
ANDVT	J2	unknown	Position 5, ANDVT

Table 5-11 Connecting VDC to ANDVT Tacterm Red Digital I/O (J2)

VDC-200	VDC-300/500	VDC-400/600	ANDVT	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	C	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	A	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	G,B,a,f,g,k	GND	Signal Ground
-	-	-	-	TXC	Transmit clock to VDC
-	-	-	-	RTS	Request To Send from VDC
-	-	-	-	CTS	Clear To Send to VDC
9	9	2	H	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	10	1	Z	PTT	Push-To-Talk from VDC
11	11	3	j	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
14	-	N/A	A	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.10 AN/PSC-5

Channel Device	Interface	Mating Connector	VDC Crypto Mode
AN/PSC-5	Aux	QPL MS2746T17B35S	Position 0, KY-100

Table 5-12 Connecting VDC to AN/PSC-5

VDC-200	VDC-300/500	VDC-400/600	AN/PSC-5	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	5	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	3	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	2,20,26	GND	Signal Ground
6	6	7	4	TXC	Transmit clock to VDC
7	7	8	29	RTS	Request To Send from VDC
8	8	10	28	CTS	Clear To Send to VDC
9	9	2	4	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
13	-	N/A	2	CT0	Device Type Bit 0
14	-	N/A	2	CT1	Device Type Bit 1
15	-	N/A	2	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	5	6	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.11 KY-100 Narrowband

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KY-100	Audio/Data J2	MS3116F1419S	Position 0, KY-100

Table 5-13 Connecting VDC to KY-100 Narrowband

VDC-200	VDC-300/500	VDC-400/600	KY-100	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	C	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	D	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	F,G	GND	Signal Ground
6	6	7	U or V [‡]	TXC	Transmit clock to VDC
7	7	8	T	RTS	Request To Send from VDC
8	8	10	H	CTS	Clear To Send to VDC
9	9	2	V	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
11	11	3	R	DM	Digital mode select from VDC
12	-	N/A	F	CT0	Device Type Bit 0
13	-	N/A	F	CT1	Device Type Bit 1
14	-	N/A	F	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

[‡] U is connected for dual clock mode, V is connected for single clock mode

5.12 KY-100 Wideband

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KY-100	Audio/Data J2	MS3116F1419S	Position 6, KY-58 HD

Table 5-14 Connecting VDC to KY-100 Wideband

VDC-200	VDC-300/500	VDC-400/600	KY-100	Signal Name	Description
N/A	1	N/A	M	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	C	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	D	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	F,B,N	GND	Signal Ground
-	-	-	-	TXC	Transmit clock to VDC
-	-	-	-	RTS	Request To Send from VDC
-	-	-	-	CTS	Clear To Send to VDC
9	9	2	V	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	10	1	P	PTT	Push-To-Talk from VDC
11	11	3	R	DM	Digital mode select from VDC
12	-	N/A	F	CT0	Device Type Bit 0
-	-	N/A	-	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	15	N/A	K	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.13 AN/PRC-117F/150/138B

Channel Device	Interface	Mating Connector	VDC Crypto Mode
AN/PRC-117F/150/138B	Data J2	Mil-Con MC2127	Position 4, KG-84 HD / MD-1324

Table 5-15 Connecting VDC to AN/PRC-117F/150/138B

VDC-200	VDC-300/500	VDC-400/600	117F/150/138B	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	6	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	19	TXD	Transmit Data from VDC
4	4	6	16	DTR	Data Terminal Ready from VDC
5	5	12	5,13,20, 25	GND	Signal Ground
6	6	7	3	TXC	Transmit clock to VDC
7	7	8	26	RTS	Request To Send from VDC
8	8	10	1	CTS	Clear To Send to VDC
9	9	2	3	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	5	CT0	Device Type Bit 0
13	-	N/A	5	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	5	2	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.14 KIV-7

Channel Device	Interface	Mating Connector	VDC Crypto Mode
KIV-7	J3	Amphenol 205562-2	Position 1, STU-III

Table 5-16 Connecting VDC to KIV-7

VDC-200	VDC-300/500	VDC-400/600	KIV-7	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	3	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	2	TXD	Transmit Data from VDC
4	4	6	20	DTR	Data Terminal Ready from VDC
5	5	12	7,14,19, 23	GND	Signal Ground
6	6	7	15	TXC	Transmit clock to VDC
7	7	8	4	RTS	Request To Send from VDC
8	8	10	5	CTS	Clear To Send to VDC
9	9	2	17	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
13	-	N/A	7	CT1	Device Type Bit 1
14	-	N/A	7	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.15 PRC-138

Channel Device	Interface	Mating Connector	VDC Crypto Mode
PRC-138	Data	General Connector GC-U-316/U	Position 0, KY-100

Table 5-17 Connecting VDC to PRC-138

VDC-200	VDC-300/500	VDC-400/600	PRC-138	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	C	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	D	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	J	GND	Signal Ground
6	6	7	R	TXC	Transmit clock to VDC
7	7	8	P	RTS	Request To Send from VDC
8	8	10	L	CTS	Clear To Send to VDC
9	9	2	R	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	J	CT0	Device Type Bit 0
13	-	N/A	J	CT1	Device Type Bit 1
14	-	N/A	J	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	5	H	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.16 PRC-6725E, PRC-139

Channel Device	Interface	Mating Connector	VDC Crypto Mode
PRC-6725E, PRC-139	Radio Side	Racal 1100517-501	Position 5, ANDVT

Table 5-18 Connecting VDC to PRC-6725E, PRC-139

VDC-200	VDC-300/500	VDC-400/600	PRC-6725E	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	15	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	16	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	6	GND	Signal Ground
-	-	-	-	TXC	Transmit clock to VDC
-	-	-	-	RTS	Request To Send from VDC
-	-	-	-	CTS	Clear To Send to VDC
9	9	2	19	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
10	10	1	4	PTT	Push-To-Talk from VDC
11	11	3	18	DM	Digital mode select from VDC
-	-	N/A	-	CT0	Device Type Bit 0
13	-	N/A	6	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.17 Saber Radio

Channel Device	Interface	Mating Connector	VDC Crypto Mode
Saber Radio	Data	ITT Cannon MIKQ6-7SH003	Position 4, KG-84HD/MD-1324

Table 5-19 Connecting VDC to Saber Radio

VDC-200	VDC-300/500	VDC-400/600	Saber Radio	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	5	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	7	TXD	Transmit Data from VDC
4	4	6	1	DTR	Data Terminal Ready from VDC
5	5	12	Shield	GND	Signal Ground
6	6	7	3	TXC	Transmit clock to VDC
7	7	8	6	RTS	Request To Send from VDC
8	8	10	4	CTS	Clear To Send to VDC
9	9	2	3	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	Shield	CT0	Device Type Bit 0
13	-	N/A	Shield	CT1	Device Type Bit 1
-	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	5	2	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.18 ARC-210 (RT-1794)

Channel Device	Interface	Mating Connector	VDC Crypto Mode
ARC-210 (RT-1794)	P8/J8	D38999/26WD35SA	Position 4, KG-84HD/MD-1324

Table 5-20 Connecting VDC to ARC-210

VDC-200	VDC-300/500	VDC-400/600	ARC-210	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	22	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	21	TXD	Transmit Data from VDC
-	-	-	-	DTR	Data Terminal Ready from VDC
5	5	12	4	GND	Signal Ground
6	6	7	28	TXC	Transmit clock to VDC
7	7	8	36	RTS	Request To Send from VDC
8	8	10	31	CTS	Clear To Send to VDC
9	9	2	23	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	4	CT0	Device Type Bit 0
13	-	N/A	4	CT1	Device Type Bit 1
14	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600

5.19 ViaSat VCS-232 Channel Simulator

Channel Device	Interface	Mating Connector	VDC Crypto Mode
ViaSat VCS-232	Port A, Port B	25-pin D-Sub Male	Position 4, KG-84HD/MD-1324

Table 5-21 Connecting VDC to ViaSat VCS-232 Channel Simulator

VDC-200	VDC-300/500	VDC-400/600	VCS-232	Signal Name	Description
N/A	-	N/A	-	HPDMIC	Dedicated Handset Dynamic Mic from VDC
2	2	4	3	RXD / HA	Receive data / Handset Analog [†] to VDC
3	3	11	2	TXD	Transmit Data from VDC
4	4	6	20	DTR	Data Terminal Ready from VDC
5	5	12	1,7	GND	Signal Ground
6	6	7	15	TXC	Transmit clock to VDC
7	7	8	4	RTS	Request To Send from VDC
8	8	10	5	CTS	Clear To Send to VDC
9	9	2	17	RXC / HD	Receive Clock / Handset Dynamic Mic [†] to VDC
-	-	-	-	PTT	Push-To-Talk from VDC
-	-	-	-	DM	Digital mode select from VDC
12	-	N/A	1	CT0	Device Type Bit 0
13	-	N/A	1	CT1	Device Type Bit 1
14	-	N/A	-	CT2	Device Type Bit 2
N/A	-	N/A	-	HPAO	Dedicated Handset Analog to VDC
N/A	N/A	-	-	DCD	Data Carrier Detect to VDC

[†] Signals used in voice mode only, not supported in VDC-400/600